

Halsey Taylor®

SERVICE MANUAL
ELECTRIC WATER COOLERS

- INSTALLATION
- MAINTENANCE
- SERVICE ANALYSIS
- FIELD SERVICE OPERATIONS

On All Models

THE HALSEY W. TAYLOR CO.
WARREN, OHIO

FOREWORD

This Service Manual covers the complete line of **HALSEY TAYLOR ELECTRIC WATER COOLERS**. It has been given the utmost thought and careful preparation to better acquaint you how to install and care for this fine water cooling unit.

By following the information contained in this service manual you will have many years of delightful, trouble-free service.

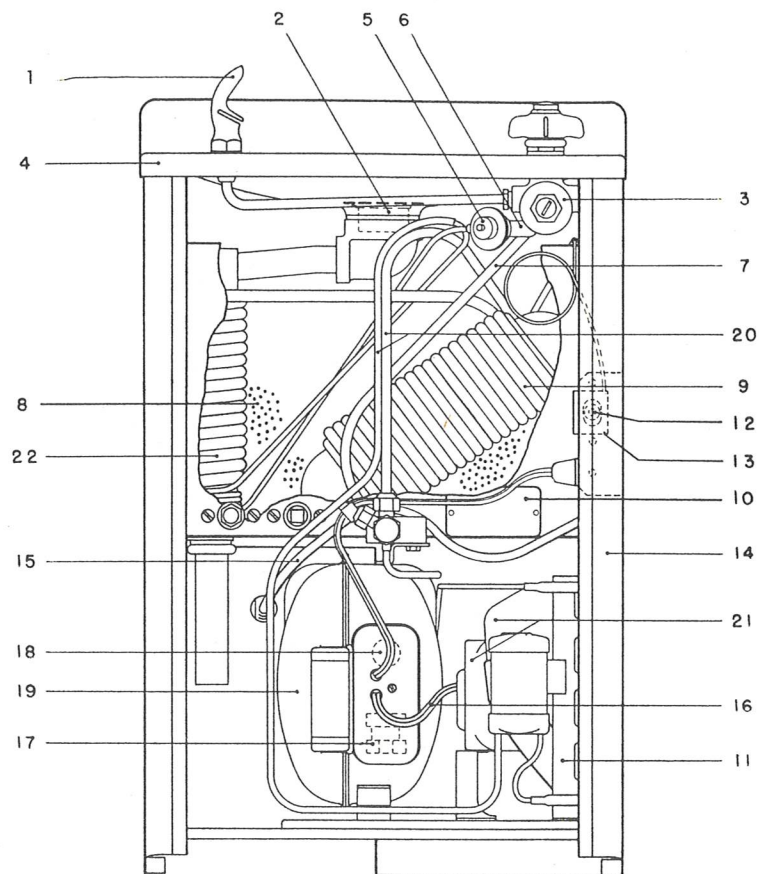
HALSEY TAYLOR ELECTRIC WATER COOLERS are engineered, assembled and individually tested with one thought in mind:

A SATISFIED CUSTOMER

PLEASE KEEP THIS SERVICE MANUAL ON FILE. It will be appreciated by any local competent Refrigeration Service Man in the event his services are required.

THE HALSEY W. TAYLOR CO.

Warren. Ohio



WM-MODELS
(Air Cooled)
(WM-11-A Illustrated)

ITEMIZED PARTS LIST

- | | |
|--|--|
| 1. Projector | 12. Temperature Range Screw |
| 2. Non-Splash Drain | 13. Thermostat Control |
| 3. Cold Water Line W/Combination Self-Closing
Stop and Automatic Stream Regulator | 14. Cabinet Assembly |
| 4. Cooler Top | 15. Service Cord (Wiring Harness) |
| 5. Expansion Valve W/By Pass | 16. Fan Cord |
| 6. Dryer | 17. Relay |
| 7. Refrigerant Line | 18. Overload Protector |
| 8. Insulation | 19. Condensing Unit (Hermetic High Side) |
| 9. Storage Tank (Low Side) | 20. Liquid and Suction Line |
| 10. Name Plate (Serial No.) | 21. Fan and Motor Assembly |
| 11. Condenser (Air Cooled) | 22. Waste Line and Pre-Cooler |

NOTE: EXPANSION VALVE (item 5) and DRYER (item 6) will be furnished as a dehydrated and sealed assembly for replacement service. (Neither item will be furnished separately.)

All correspondence pertaining to these coolers or orders for repair parts **MUST** be accompanied by Model No. and Serial No. of cooler and Name of Part required.

ADDITIONAL INFORMATION ON OTHER SIDE

ROUGHING-IN, MOUNTING AND ELECTRICAL INSTRUCTIONS

NOTE — The "Wall Mount" can be located on the wall at any desired height. 40" from basin to floor (standard) or 30" to floor for small children.

Procedure (See plate 2).

- Provided concealed 2 x 4 wood blocking back of finished wall face for 3" x 16" x 1/8" Hanger Plate. Also provide blocking for wall screws at bottom of cabinet.
- Space Hanger Plate away from blocking so back of plate will be flush with wall face. Secure Hanger Plate to blocking with (8) No. 12 x 2 1/4" wood screws (Furnished).
- Install 1 1/4" IPS slip Trap 4 5/8" from wall face to center of trap inlet. (Note: 1 1/4" building waste line to extend 1 1/4" out from wall face). Trap not furnished.
- Install 3/8" IPS union connection and service stop to building supply line. (Note: 3/8" IPS building supply line to extend 1 1/2" out from wall face). Union connection and service stop not furnished.
- Electrical receptacle to be installed to receive parallel bladed plug, rated 15 amp. 125 Volt as provided on cooler.
- Cooler can now be hung onto Hanger Plate. (BE SURE SLIP CONNECTION TUBE FROM COOLER WASTE TO TRAP IS IN LINE).
- Anchor bottom of cabinet to bottom blocking with (2) No. 12 x 1 1/2" wood screws (Furnished).
- Connect water supply line of building to 3/8" IPS inlet connection located on front of evaporator casing, inside of cabinet.
- Actual weight of cooler is 95 lb.

NOTE: 1/8" space is provided between back of cooler cabinet and wall face. This space permits hanger clearance and has cushioned pads to act as sound deadeners. Wall splash plate of cooler top fits flush with wall face.

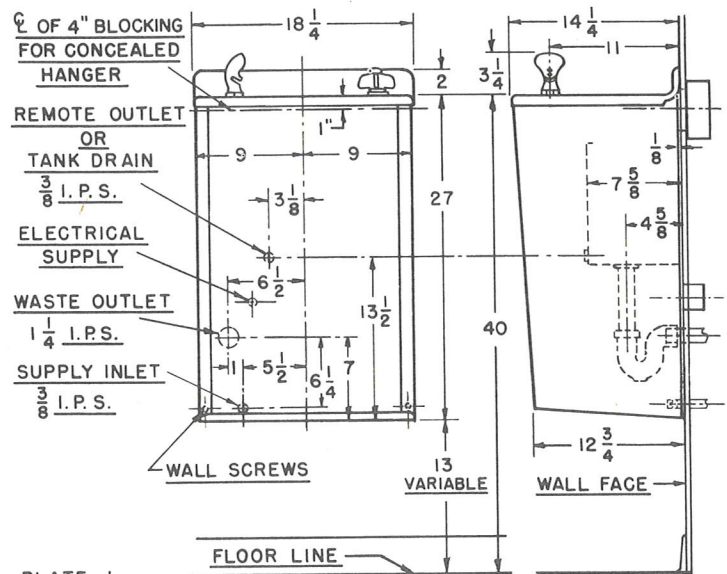
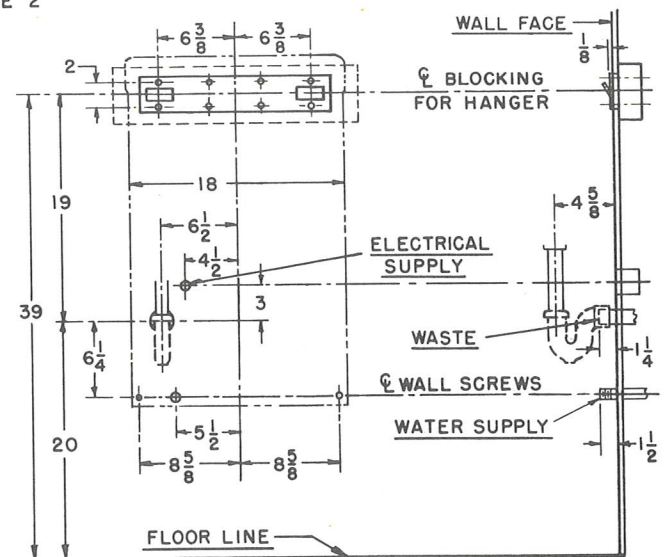


PLATE 1
PLATE 2



INDEX

	PAGE NO.
GENERAL INFORMATION	1
INSTALLATION INSTRUCTIONS TO PLUMBER AND ELECTRICIAN	1
MAINTENANCE INSTRUCTIONS	2
INSTRUCTIONS TO REFRIGERATION SERVICE MAN	3
REMOTE ELECTRIC WATER COOLERS	4
(1) Cabinet Type	
(2) Package Or In-Wall Type	
SERVICE ANALYSIS CHART	4
FIELD SERVICE OPERATIONS	5
WIRING DIAGRAMS:	
FIG. 1, HERMETICS UP THRU 1/2 HP.	5
FIG. 2, HERMETIC UNIT, 3/4 HP.	6

GENERAL INFORMATION

Read Carefully - It Will Be Your Gain

If service is required in the field we very strongly recommend having necessary work done by a qualified Refrigeration Service Man. More so, if you have the open type refrigerating system in your Electric Water Cooler. If failure occurs in a hermetically sealed refrigerant system (motor or compressor) contact our factory through your dealer, giving all facts of difficulty. In all matters pertaining to repair, replacement parts, or care of your Electric Water Cooler, give MODEL NUMBER, SERIAL NUMBER, and NAME OF PART REQUIRED. If you do this, it will save you valuable time and enable us to give you correct,

immediate service. Never return any Halsey Taylor Electric Cooler, or part to the factory until you have received a written authorization from The Halsey W. Taylor Company, in Warren, Ohio.

Name plate, giving model number, serial number and motor rating, will be found on back of cabinet at right upper corner, or on front face of insulation casing inside of cabinet.

LOOSE SHEET IN FRONT OF MANUAL SHOWS ITEMIZED PART LIST AND SCHEMATIC OUTLINE OF ELECTRIC WATER COOLER.

Installation Instructions to Plumber and Electrician

COMPLY WITH FOLLOWING INSTRUCTIONS BEFORE CONNECTING TO ELECTRICAL SUPPLY

1. Place in convenient, level location, maintain a 4-inch minimum clearance around cooler for adequate ventilation. (Air cooled models).

2. Observe identification marks stencilled on back of cabinet for plumbing connections—Waste Outlet, Water Inlet, Remote Fountain Supply. On Water Cooled models the water condenser inlet and outlet are plainly marked.

3. To assure adequate volume of water at projector, it is necessary that supply line (new or old) be sufficiently flushed, before connecting to cooler, to remove all foreign matter, which could clog small orifice of Combination Self-closing Stop and Automatic Stream Regulator No. 3. The above precaution should also be taken for the Condenser Water Supply, (on water cooled models), to prevent clogging of Condenser Water Valve, and Condenser Coil. A restriction will seriously affect operating efficiency of water valve and condenser. If flushing will not assure permanent freedom from foreign materials, install strainer such as Halsey Taylor Part No. 2483. We recommend plumbing connections to be made with unions to simplify future relocation of cooler. Install shut-off valve between union and supply line. Cooler is not equipped with trap.

4. After plumbing connections have been made, turn on water supply. Electric Coolers with 10 gallon

water storage tanks on up are equipped with manually operated Air Release Vent, located near top of insulation casing, inside of cabinet. Coolers with storage tanks below 10 gallon water storage have automatic air release.

5. If cooler is to serve a remote fountain, connecting line should be well insulated and remote fountain should not be located more than 15 ft. from cooler.

6. Coolers are equipped with combination self-closing stop and automatic water stream regulator No. 3. to operate satisfactorily at 20 psig. minimum and 90 psig. maximum water supply line pressure. Higher pressures require a pressure reducing valve located in supply line leading to cooler. (If necessary to adjust projector stream height, see maintenance instructions No. 3). (This does not apply to remote Type Electric Water Coolers. Regulators for stream height are located on fountains served from remote installation).

7. **Temperature controls** are set at factory. DO NOT CHANGE. Before connecting to power supply line check for correct electrical service. Coolers operate on 115 Volt, single phase, 50/60 cycle, A. C. After electrical connection has been made, be sure condenser fan No. 21 on AIR COOLED models is operating. On WATER COOLED models the condenser water valve is correctly set at factory for average operating conditions. If necessary to change these settings, we recommend adjustments being made ONLY by a competent Water Cooler Refrigeration

Service Man. Duration of the first cooling cycle will be prolonged to some extent. This depends on the temperature of the inlet water and surrounding air. If temperature of supply water to cooler is below 45 degrees F, cooler will not start.

8. (CAUTION)—Make sure power supply line to cooler is not over-burdened. If this condition does exist, over-heating from low voltage may cause over-

load protector on motor to cut out, thereby breaking electrical contact.

9. Before leaving job make sure water supply line has no restriction due to partially closed intervening valves, which will reduce water volume to cooler. A reduced volume will render the automatic stream regulator inoperative.

Maintenance Instructions

ADJUSTMENTS—

1. **Projector**—No. 1—Mineral content of water will deposit itself at the outlet of the orifices. This tends to distort the stream angles as well as to increase the stream height, making it difficult to obtain a satisfactory drink. To remove this deposit use a small nail or small round file. (CARE MUST BE TAKEN NOT TO FILE INTO THE METAL.)

2. **Combination Self-Closing Stop and Automatic Water Stream Regulator**—No. 3—To eliminate play in operating valve handle, remove knurled cap, lift lock sleeve and tighten splined nut, finger tight. (CAUTION) — Excessive tightening will lift valve stem from seat and cause continuous flow of water through projector. Life of operating mechanism will be prolonged by proper adjustment. Occasionally, while making handle adjustment, ball bearings, which are located underneath valve handle, should be lubricated with a graphite base cup grease. (Above adjustment applies to coolers with hand valve only). Valve body has a renewable type seat, easily removed by unscrewing with a ¼" square key rod. This renewable seat No. 6451 can be obtained by writing to the Halsey Taylor Co.

3. **Automatic Water Stream Regulator**—No. 3—A proper drinking stream extends about 1½" above top of projector. To adjust, remove outer slotted cap, turn adjusting screw clockwise to raise stream, counter-clockwise to lower stream. If adjustment does not change stream height (First) check water pressure to cooler (Minimum pressure 20 psig.). (Second) if supply line is equipped with strainer, make sure the screen is clean. (Third) Check condition of diaphragm assembly and bushing by removing cap from valve body. Be careful not to lose adjustment spring and large washer. Pull out diaphragm assembly, remove bushing in center of body with broad point screw driver. These parts will require periodical replacement, depending on local water conditions. Before re-assembling, check small outlet orifice (No. 35 drill) in diaphragm chamber for obstructions due to a for-

ign matter or mineral content of water. Any restriction at this point will reduce volume of water at projector No. 1. Glass Fillers on Cafeteria Coolers are equipped with Regulating Stems, No. 3. To regulate stream volume, loosen Hex Regulator Packing Cap on glass filler faucet only enough to allow turning regulating stem to right or left. After adjustment, tighten Hex Regulator Packing Cap securely. Coolers equipped with combination projector and automatic stream regulator have the automatic stream regulator (No. 3), located in the projector (No. 1). Remove the nut and push button cap and adjust the stream height by turning the exposed screw clockwise to raise and counter-clockwise to lower the stream. If this adjustment does not change the stream height, first, check the water pressure to the cooler (Minimum pressure 20 psig.—maximum pressure 90 psig.). Second, if the supply line is equipped with a strainer, make sure the screen is clear. Third, check the condition of the diaphragm assembly by removing the adjusting screw and adjusting spring. Then loosen the small diaphragm retaining screw. Remove the brass body by using a spanner wrench. This will enable you to inspect, and if necessary, replace the diaphragm. Reassemble the mechanism carefully, being sure that diaphragm and orifice chamber are free of any foreign matter, which would render the valve ineffective.

4. **Water Temperature Control** — No. 13 — This device is set at factory to deliver 50 degrees F. (approx.) drinking water. This temperature may be varied (plus or minus) 10 degrees F. To adjust, turn range screw — No. 12 — clockwise for colder, and counter-clockwise for warmer. (CAUTION)—Range screw has built-in stops at maximum high and low settings. Do not force screw against stops. Check water temperature with accurate thermometer at projector, before and after adjusting. Too cold a setting will result in excessive operation of unit. Water cooled models ½ H. P. and up are equipped with combination Thermostat and high pressure cut out control with 175 psig. setting. DO NOT CHANGE HIGH PRES-

SURE SETTING UNDER ANY CIRCUMSTANCES. (To adjust water temperature setting, proceed as mentioned above). To assure satisfactory performance of cooler we recommend using only factory replacement control. (CAUTION) — If replacement is made, make sure bulb reaches bottom of well.

5. **IMPORTANT** — If satisfactory performance cannot be obtained after the above instructions have been followed, we recommend that you obtain the services of a competent water cooler refrigeration serviceman, preferably one familiar with hermetic condensing units.

6. **Lubrication** — See Item No. 1 of Instructions to Refrigeration Service Man.

7. **Ventilation** — Keep louvered or screen openings of cabinet clean from lint or dust to assure air flow for maximum efficiency of refrigerating unit. Dirt and lint must be removed periodically from condenser fins

by using air hose or suitable brush. Proper care at these points will assure unrestricted circulation of air.

8. **Care of Exterior** — It is recommended for sanitary reasons that the cooler top and chrome trim be cleaned regularly with a cleansing agent that does not have ingredients which are harmful to porcelain enamel, stainless steel and vitreous china.

9. **Storage of Cooler** — If location of cooler is such that it is subject to freezing temperatures, care should be taken to completely drain storage tank by removing pipe plug from remote fountain supply connection, and holding projector operating valve—No. 3—open to facilitate drainage. Water cooled models must have the water condenser coils completely drained. This can be done by applying air pressure thru condenser inlet connection until all water has been completely evacuated from condenser coil. Disconnecting water valve will facilitate drainage.

Instructions to Refrigeration Service Man

1. **Lubrication** — Hermetically sealed motor and compressor units and fan motors are permanently lubricated and require no further attention. Open type units (Belt Driven Compressor) should have oil level and bearings checked at least twice a year. This should be done by a competent Refrigeration Service Man.

2. **Water Temperature Control** — No. 13 — (See Item No. 4—Maintenance Instructions). In case of failure, we recommend ordering replacement from factory, which will insure the correct range, differential, and capillary compensation for this cooler. This control is supplied to us by the manufacturer in accordance with our specifications. (CAUTION)—When replacing control, care should be taken to see that capillary tube is slightly wavy, which will insure proper contact with capillary well, also make sure capillary tube reaches bottom of well.

3. **Automatic Expansion Valve**—No. 5—This is a special valve due to a by-pass feature which permits unloading and equalization of pressures during the off cycle. (CAUTION)—This valve is set at 35 psig. and under no circumstances should this setting be changed. (The above does not apply to coolers equipped with capillary system).

A higher setting will decrease the efficiency of the cooler, while a lower setting will make possible a low-side freeze-up. In the event of valve failure, the replacement, due to its special features is obtainable only through our factory. **UNDER NO CIRCUMSTANCES SHOULD ANY OTHER VALVE BE USED.**

4. **Refrigerant System** — We do not recommend the refrigerant system being opened in the field unless the PROPER facilities are available for Dehydrating, Evacuating and Accurate Charging. Correct refrigerant and amount of charge in lbs. are noted on name plate located on back of cabinet, or on insulation Casing inside of cabinet. (See Part 5 of Field Service Operation, Recharging System with Freon 12). Extreme care must be taken if refrigerating system has been opened for any reason. Make sure refrigerant valves are back seated tightly before removing gauges. All flare nuts, gauge ports and sealing caps must be thoroughly cleaned and securely tightened. We recommend all valve stems and other connections be gas tested with a good Leak Detector before leaving job. (See Part 4 of Field Service Operation, Testing for Freon Leaks).

Remote Type Electric Water Coolers

1. **Cabinet Type Remote Coolers** do not have Projectors, Receptor Basins, Wastelines, or volume regulators located on cooler. However, the basic requirements are the same as Conventional type electric water coolers.

2. The best efficiency is obtained by locating Remote Fountains not more than fifteen (15) feet from Remote Cooler. A three-eighths inch tinned copper tubing, well insulated, is recommended to minimize heat transfer in supply line to Remote Fountains. We do not recommend connecting more than two (2) Remote Fountains to one Remote Cooling Unit.

3. **Automatic Water Stream Regulators** are located

on Remote Fountains served from Remote Water Cooling Unit. For adjustment of stream height see (Part 3 of Maintenance Instructions).

4. **Package, or In-Wall Type** cooling units are basically the same as Cabinet Type Remote Coolers, except they are used for installations under counters or located in walls. If location of this type cooling unit will not permit a minimum clearance of 2 inches, a ventilated opening must be provided against face of condenser. Adequate ventilation must be provided for proper performance.

5. Follow Instructions to Plumber, Electrician and Refrigeration Service Man in fore part of this manual.

Service Analysis Chart

1. OPERATION FAILURE:

- a. Check for correct power supply, power failure or loose connections. If unit still fails to operate, proceed as follows.
- b. Disconnect hermetic unit plug from junction box or wiring harness and connect direct to electrical outlet. If unit operates then trouble is either in water temperature control or wiring harness.
- c. If direct connection does not operate unit, check overload protector and relay. (See Part 1 of Field Service Operations, "Checking Electrical System.")
- d. Note — If supply water temperature is below 45 degrees F., unit will not start.
- e. If unit still does not operate, the trouble is probably in compressor and should be replaced. (See Part 6 of Field Service Operations, "Replacing Complete Hermetic Unit").

2. OVERLOAD (Thermal)

Both Hermetic units and motors used on open type units have overload protectors. Overload is caused by excessive head pressure usually from one of the following causes:

- a. Fan not operating on Air Cooled models.
- b. High inlet water temperature, or restricted flow through water condenser coil on water cooled models.
- c. Abnormally high inlet water or room temperature.

- d. Condenser Fins covered with dirt or lint on air cooled models.
- e. Inadequate ventilation clearance on air cooled models.
- f. High or low voltage will also cause overloading of motor.

If unit tries to operate when any of above conditions exist, a noticeable clicking or buzzing sound will be detected in the overload and relay box on hermetic compressors.

3. INSUFFICIENT COOLING:

- a. Water consumption in excess of cooling capacity.
- b. Defective expansion valve.

NOTE: For normal operating conditions room temperature 90 degrees F., Inlet water temperature 80 degrees F., the head pressure should be about 170-190 psig. on Air Cooled Models, and 125-140 psig. on Water Cooled Models at a suction pressure of 35 psig. A lower suction pressure will indicate a defective expansion valve (tap body of valve to make sure valve needle is not sticking) or it may indicate an incorrect setting, or a low refrigerant charge. See Part 3 "Field Service Operation". If the latter is found to be true, unit should not be recharged until leak has been found and repaired. (See Item No. 4 — Instructions to Refrigeration Service Man).

REMEMBER THIS !!!

MANY TIMES A SERVICE MAN IS CALLED WHEN THE ONLY TROUBLE IS BLOWN FUSE OR DEFECTIVE SERVICE CORD.

Field Service Operations

Printed through Courtesy of Tecumseh Products Co., Inc., Tecumseh, Michigan

PART 1

CHECKING ELECTRICAL SYSTEM

The complete electrical system on the Tecumseh hermetic system can be checked completely and thoroughly with an ordinary test lamp as follows: (See Figure 1).

Unit Plugged In

Test lamp across the following must light:

1. L¹ and L²—no light—check power source.
2. L and 3—no light—make sure control contacts are closed.
3. M and 3—no light—relay circuit open replace relay.
4. M and 1—protector may be tripped off. (Wait 10 minutes). If no light, then protector is defective—Replace protector.

Remove Wires from L and 3.

Insert test lamp in series with L¹ and 3. Touch L² to following points momentarily in sequence listed:

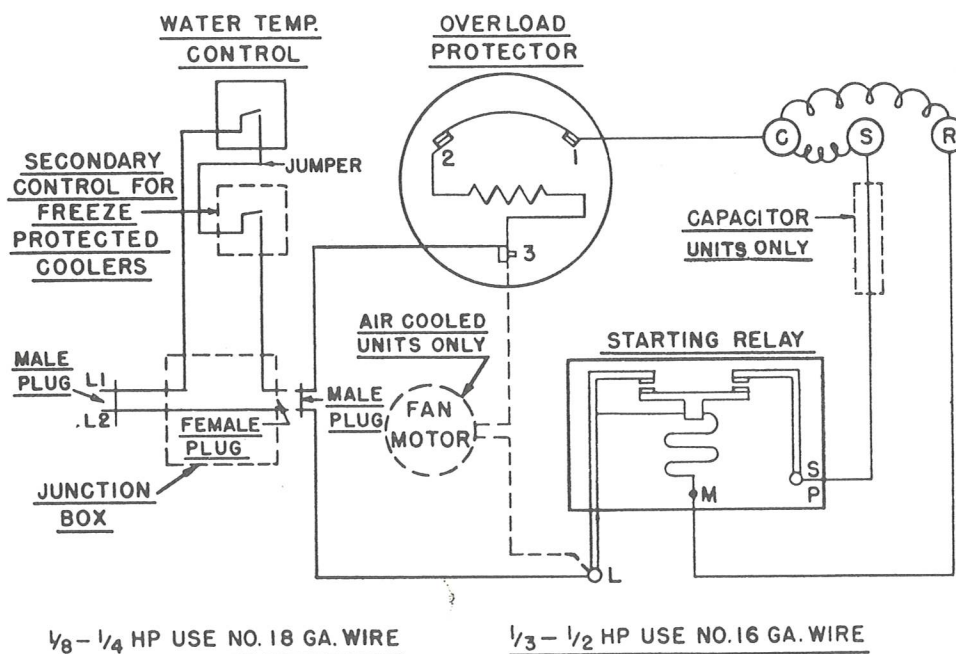
- S. No light—open run winding—replace compressor.
- R. No light—open run winding—replace compressor.
- P. No light—lead P-S defective (or, if capacitor is used, open capacitor circuit).
- M. No light—lead M-P defective.
- L. No light—defective relay.

Remove Lead—M-R.

Test lamp in series with L¹ and 3. If light shows when L² is touched to L, relay is defective—replace.

If all above tests prove satisfactory, and there is no expansion valve restriction, and unit still fails to operate properly, change relay. If good relay fails to correct difficulty, the unit shall be considered inoperative because of internal defects and must be replaced. (See Part 6 "Replacing Complete Hermetic Unit").

NOTE: The new relay will eliminate any faulty electrical characteristics, such as improper pick-up or drop out, which cannot be determined with test lamp.

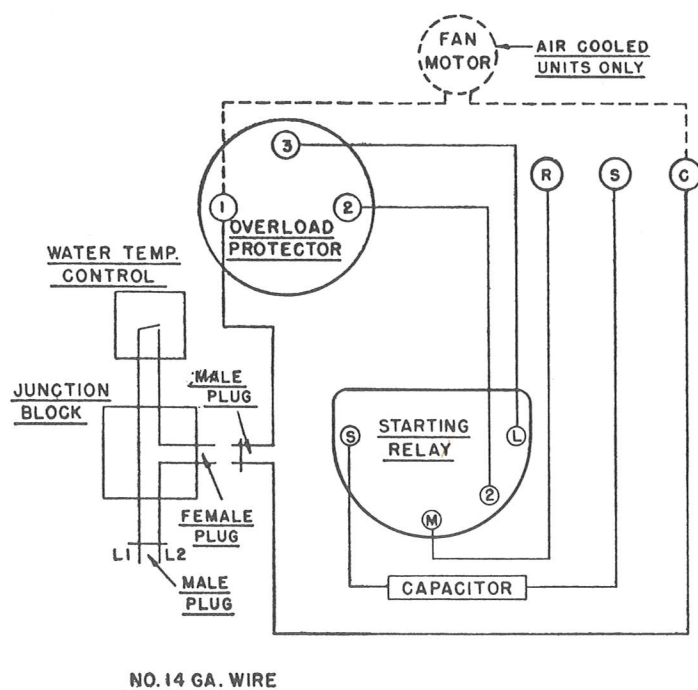


$\frac{1}{8}$ - $\frac{1}{4}$ HP USE NO. 18 GA. WIRE

$\frac{1}{3}$ - $\frac{1}{2}$ HP USE NO. 16 GA. WIRE

**WIRING DIAGRAM
FOR HERMETIC UNITS UP
THRU $\frac{1}{2}$ HP**

FIGURE 1.



WIRING DIAGRAM
FOR $\frac{3}{4}$ HP HERMETIC UNITS

FIGURE 2.

NOTE: When ordering replacement overload protector, or relay, give manufacturer's number of part, along with Model No. and Serial No. of cooler.

PART 2

MOTOR CYCLING ON THERMAL OVERLOAD

If motor cycles on the overload, check for the following:

1. Dirty Condenser—restricted air flow over unit (air duct opening restricted) or low voltage.
2. Expansion Valve restricted or frozen up. If this condition is suspected, pull plug for five (5) minutes, allowing time for pressure to equalize (unless expansion valve is frozen or restricted). Replace plug and observe action. If thermal overload continues to trip off, install gauges and analyze trouble as outlined under Part 3, "Pressure Readings".
3. Defective starting relay—check as outlined on Part 1, "Checking Electrical System."
4. Defective thermal overload. If head pressure is not excessive when checked in (2) and compressor shell temperature does not seem excessive, check for defective thermal overload as outlined on Part 1, "Checking Electrical System."

PART NO. 3

PRESSURE READINGS

If operating pressures are not normal, the following will be found helpful in analyzing the trouble:

1. Low suction and low head pressure:
Indicates an under charge of refrigerant (due to a leak, unless system has been purged). Check for leaks as outlined in (Part 4, "Testing for Freon Leaks").
2. Low suction and high head pressure:
Indicates a partial restriction of the Expansion valve. The Expansion valve connecting tube should be slightly warmer than room temperature. If the connecting tube is cold, sweating, or frosted, it indicates the Expansion valve has a partial restriction. If trouble cannot be corrected, a replacement of Expansion valve is necessary.
3. High suction pressure about equal with low head pressure:
Indicates the compressor is not pumping and the Hermetic Condensing Unit must be re-

NOTE—Field Service Operation, Part 3, 5, and 6 pertain to systems equipped with suction and liquid service valves. A liquid valve can be incorporated by service man, on systems having suction valve only.

placed. (See Part 6 "Replacing Complete Hermetic Unit").

4. High suction and head pressure:

This condition caused by any of the following reasons:

- (a) Overcharge of Refrigerant (See Part 5, "Recharging System").
- (b) Air in system due to leak in low side or improper service procedure,—Air in system takes the space which is normally occupied by Freon. This makes the head pressure and suction pressure run high and results in inefficient operation and an overloaded motor. Under normal conditions, with compressor running, the condenser tubes will be hot at the top and warm at the bottom. With air in the system, the top tubes will be cool or only warm while the bottom tubes will be very hot.

To purge air from system, shut off the compressor and remove sealing cap from liquid valve service port. Next, open valve slightly off of back seat and allow mixture of air and Freon to escape for approximately fifteen (15) seconds. It will probably be necessary to repeat this several times, running the compressor ten (10) minutes or so between purgings, to get all the air out of the system. Inasmuch as some of the refrigerant charge will be lost during the purging operation, check the charge after purging and add Freon if necessary. (See Part 5, Recharging system). In extreme cases, where head pressure does not drop to normal, it may be necessary to pump the entire remaining charge out of the system and recharge. To do this, run the compressor with liquid valve front seated, and with liquid valve gauge port open until no more gas is discharged. Replace cap on port before back seating liquid valve. Recharge with complete new charge.

5. Defective compressor or motor—Check as outlined under Part 1, "Checking Electrical System".

PART 4

TESTING FOR FREON LEAKS

In case an undercharge of refrigerant is apparent (and the system has not been purged or recently recharged), the complete system should be tested for leaks. In checking for leaks with a Halide Torch leak detector, keep the following points in mind:

1. Pressure inside system should be at least 75

pounds on low side and 150 pounds on high side. Block off the condenser to increase for testing.

2. Halide Torches are sensitive. A trained operator can detect a leak which would require several years to leak one pound of refrigerant. Freon released in purging must be thoroughly blown away before checking for leak. Do not have the flame too large, or small leaks cannot be detected. Keep the end of rubber tube clean and free of oil. Pass the pick-up tube very slowly around all sides of the joint or connection being tested. Inasmuch as Freon is heavier than air, it is usually faster to check just below the suspected leak first. Make certain that the copper reaction plate on the torch has not been burned away or dropped out. If in doubt, check the torch on a drum of Freon by slightly cracking drum valve. A General Electric Leak Detector is far more sensitive than a Halide Torch and should be used for leak checking if available.

PART 5

RECHARGING SYSTEM WITH FREON

1. The refrigerant charge in any particular hermetic system is of course determined by the manufacturer of the complete product. The correct charge is that quantity of refrigerant which will refrigerate all the evaporator coils and, at the same time, will not cause frosting or sweating of the suction line.

2. **Adjusting Freon charge:** Unless the system is badly over-charged (suction line frosting badly) do not attempt to adjust the charge until cabinet temperature has pulled down to normal and the unit is cycling regularly. To purge off excess charge, remove liquid valve stem cap and make certain valve is back seated (screw valve in slightly then out to check). Remove cap from service port. With unit running, crack liquid valve off its back seat for a few seconds allowing excess liquid charge to "purge off". Before purging again, melt any frost off suction line with heat from your hand and observe whether it reappears while the unit makes several cycles. **CAUTION:** Do not purge too rapidly or too much at a time or you may over-purge, necessitating recharge. Each particular fixture or application will have a specific frost line, depending upon low side design, etc.

3. **Adding Freon charge:** If too much charge is purged off, or if charge has been partially lost due to a leak in system, additional Freon may be added as follows:

CAUTION: Make sure that all lines and fittings, as well as the Freon to be added, are absolutely dry and clean.

Extreme care must also be used not to allow any air to enter system. Before removing cap from suction

valve service port, always make certain that the suction valve is back seated because there could be a vacuum in the low side which would draw air and moisture into the system if the valve was not tightly back seated when cap is removed.

Use a short piece of dry, clean 1/4" copper tubing to connect the Freon drum to the suction valve gauge port. The Freon drum should be set upright so gas, rather than liquid, will be added if only a small amount of additional charge is required. If most or all of the charge is to be replaced, liquid Freon can be added to hasten charging and eliminate some frosting of drum and charging line. The charging line must be purged of air before opening compressor suction valve. To purge charging line, connect line to service drum and tighten flare nut on drum connection. Then connect other end of line to service suction valve port and leave flare nut loose. Crack valve on Freon drum and blow air out at loose flare nut on service valve. Tighten flare nut, open valve on drum and with compressor running, screw suction valve stem in about one-half to one turn for a minute or so at a time, adding charge slowly until frost line in cabinet is normal and suction line temperature is correct.

IMPORTANT: If Freon drum or charging line frost up or collect moisture, heat them slightly with a torch while adding charge and make certain that the charging line connections are all warm and perfectly dry before disconnecting them.

After charge is properly adjusted, replace all valve caps and service port sealing caps and tighten securely. Check all connections for leaks with Halide torch, or General Electric Leak Detector.

PART 6

REPLACING COMPLETE HERMETIC UNIT

If it has been definitely determined that the hermetic unit (and not the thermal overload, relay or some other part of system) is defective, remove the old unit (complete unit not just the hermetic compressor) as follows:

1. Disconnect unit from power source.

2. Close (front seat) suction and liquid valves on unit.
3. Loosen flare nut on suction line and allow charge to purge out slowly. When only a slight pressure remains, remove suction line and seal immediately with flare plug.
4. Disconnect Liquid Line flare nut from unit and seal immediately with flare plug.
5. Cap all valve connections on old unit and remove unit from cabinet.

NOTE: If system is known to be wet, low side will have to be reprocessed in accordance with specifications of manufacturer. New low side drier should be installed. See Item 4, Instructions to Refrigeration Service Man.

6. Check to make certain suction and liquid valves on new unit are front seated, then locate new unit properly in cabinet.
7. Remove plug from Liquid Line and connect immediately to liquid valve while gas is being released from tube.
8. Remove plug from suction line and connect immediately to suction valve. Leave nut cracked slightly and do not open suction valve.
9. Crack liquid valve on unit and allow Freon pressure from unit to purge through Expansion Valve into coil and out loose suction line flare nut at unit for about thirty (30) seconds. Then tighten flare nut securely, open liquid valve and back seat.
10. Make sure suction gauge port is tightly capped and packing gland nut is tight. Open (back seat) suction valve. Allow unit to run for several minutes and check liquid and suction line connections for leaks.
11. Adjust charge as previously explained.
12. Replace all caps securely and again test for leaks.

ALL CORRESPONDENCE PERTAINING TO THESE COOLERS OR ORDERS FOR REPAIR PARTS **MUST BE ACCOMPANIED BY MODEL NO. AND SERIAL NO. OF COOLER AND NAME OF PART REQUIRED.**

AFTER CARRYING OUT THE ABOVE INSTRUCTIONS, IF THE UNIT STILL FAILS TO OPERATE, CONTACT YOUR LOCAL DISTRIBUTOR OR OUR FACTORY DIRECT FOR FURTHER INSTRUCTIONS.

THE HALSEY W. TAYLOR CO.
WARREN, OHIO

